3M Company - Menomonie Plant

2005 Annual Report for the Cooperative Environmental Agreement Between 3M and the Department of Natural Resources January 30, 2006

Introduction

This 2005 annual performance report is submitted in part to meet the requirements of Section XIII, Baseline and Periodic Performance Evaluations, of the Agreement. Included in the report is the following information concerning the environmental performance of 3M Company – Menomonie during 2005:

- Involvement and input from the Interested Person's Group to the Agreement
- Evaluation of the EMS (Environmental Management System)
- Reductions of VOC per pound of good output by 25% from the year 2000
- Reductions of solid and chemical waste per pound of good output by 25% from the year 2000
- Reductions of reportable TRI emissions per pound of good output by 50% from the baseline year
 1999
- Status of implementation of an Integrated Contingency Plan (ICP)
- 2005 3P (Pollution Prevention Pays) project summaries
- General assessment of the success of the Agreement in reducing time and money spent by 3M and the DNR on paperwork and other activities that may not directly benefit the environment

Regarding the Interested Persons Group:

The 3M Company–Menomonie Interested Persons Group is composed of representatives from business, government and academia in the Menomonie area who are interested in environmental stewardship and the impact of manufacturing on local communities.

Group members include the following individuals:

- Barbara Thomas, Chippewa Valley (WI) Chapter of the Sierra Club
- Mike Beaupre, Director, Indianhead Enterprises
- Keith Bergeson, Dunn County Department of Public Health
- Mark Harings, Wisconsin Department of Natural Resources
- Paul Sterk, Superintendent, Menomonie Wastewater Utility
- Dr. Martin Ondrus, UW-Stout, Chemistry Department
- Ed Smith, City of Menomonie Planning Commission Member

Two meetings were held with the group in 2005. The first meeting was held on January 27, 2005. The purpose of this meeting was to review the content of the 2004 annual performance report prior to submittal to the WDNR. The agenda was as follows:

Introductions – All Plant Update – Jim McSweeney Review 2004 CEA Performance Report – Mike Wendt Open Forum – All

Attending from 3M were Wendt, Donnelly, Lewis, and McSweeney. Everyone from the Interested Person's Group attended with the exception of Ondrus. The performance report was reviewed in detail and accepted by the group for submittal to the Department.

The second meeting of the group was held on March 29, 2005 when Governor Doyle and WDNR Secretary Hassett visited 3M to recognize the CEA between the WDNR and 3M. The Interested Persons Group was invited to this ceremony. Attending from the group were Thomas, Smith, Bergeson, and Beaupre.

Regarding an Evaluation of the EMS:

The third party auditor, Underwriters Laboratories (UL), recertified the EMS to conformance to the new ISO 14001:2004 standard on August 25, 2005. This audit was the triennial assessment of the EMS whereby the EMS was audited to all clauses of the standard and all operational areas of the site were assessed to the standard. This audit resulted in one action request and 12 observations/opportunities to improve the EMS. The action request to which 3M was required to submit a formal corrective action plan concerned training scheduling and recordkeeping systems. The formal response was submitted to UL in September and UL will be checking the effectiveness of the corrective action in the next surveillance audit in 2006. Most of the audit observations have or will be corrected prior to the next external audit. In summary, the lead auditor had the following remarks concerning the EMS:

"3M Menomonie has a generally strong, mature environmental management system well utilized for continuous improvement. Strengths of special note include the highly effective systems and tools for continual improvement, including PSSRs [pre-start safety reviews] and MCEs [Maintenance Conscious Engineering reviews], and especially the new MOC [management of change] system; GEMSA [Global Environmental Management Self-Assessment], environmental objectives and targets, six sigma projects, and 3 Ps [Pollution Prevention Pays projects]. Also valuable to the EMS is its system of audits, resulting corrective actions, and review by management as another path to continual improvement."

Internally assessments of the EMS were conducted in all operational and service areas of the facility during the year. These audits resulted in six corrective actions that have been addressed. Regular management review is held at least quarterly with the EMS Core team and the annual review of all EMS elements was held with upper management during July.

Regarding a Summary of 2005 EMS Targets & Objectives:

The 3M-Menomonie facility has identified its environmental aspects and ranked them based on the significance of their environmental impact. Objectives and targets for 2005 were developed in December 2004 and approved by upper management in January 2005. Several of the targets and objectives were based around the corporate Environmental Targets 2005 (ET05) environmental initiatives (reductions in waste, VOCs, TRI chemical releases). The 3M Company - Menomonie facility adopted the following Environmental Objectives and Targets for 2005 at Management Review on January 11, 2005:

Objective #1:

Submit at least eight 3P (Pollution Prevention Pays) projects for the site in 2005

Target #1:
Submit at least eight 3P projects for the facility by 12/31/2005.

Results:

Eight 3P projects were submitted and approved during 2005. A summary of these projects is shown in Table

Table 1

3P Project	Description	\$ Saved	Pollution Prevented (tons)	Energy Saved (MMBTU)
Consolidate paper & cardboard recycling	Reduce 3 vendors to one vendor that takes mixed paper/cardboard waste	\$ 17,107	15.66	
Redundant LFL control on C5 primer oven	Reduces oven heat up cycle	\$ 12,800	0.212 metric tons GHG equiv.	4.0
TSS Reuse of packaging (U-boards) (Level I Award)	Return U boards to Cottage Grove for reuse	\$ 7,404	8.4	
C5 TDX box reuse (Level I Award)	Reuse TDX boxes between Menomonie & Decatur plants	\$ 5,300	3.3	
Reuse Gaylord pallet boxes for recycle of waste film	Reuse empty raw material pallet boxes to recycle waste film to an outside vendor	\$ 2,827	6.11	
Installation of thermal oxidizer on CF5 & CF6 ovens	Thermal oxidizer reduces VOC and formaldehyde emissions. Reduced maintenance compared to previous wet scrubber system	\$ 5,022	27	
OSD bulk container resin project (Level I Award)	Replace drums of resin used in the process with bulk containers. Reduced labor, waste, transportation costs, while increasing employee safety from resin exposure.	\$ 156,000	8.5 – solid waste 18.0 metric tons GHG equiv.	309

PCRP jumbo	Develop cardboard	\$ 233,600	230.0	
packaging material	packaging to replace			
development and reuse	wooden crates for export			
	that can be returned and			
	reused			

Total pollution prevented: 299 tons

Total \$ savings: \$ 440,060

Total energy savings: 313 MMBTU

GHG emissions reduced: 18.2 metric ton CO₂ equivalent

Objective #2:

Reduce VOC (volatile organic compounds) emissions per pound of good output to achieve an overall 25% reduction by the end of 2005.

Target #2:

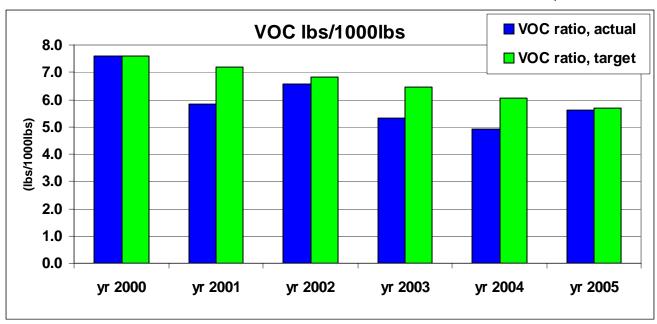
Reduce # VOC emissions/ # good output (finished, semi-finished, by-product) by 5% from previous year (2004) to achieve an overall 25% reduction since the year 2000.

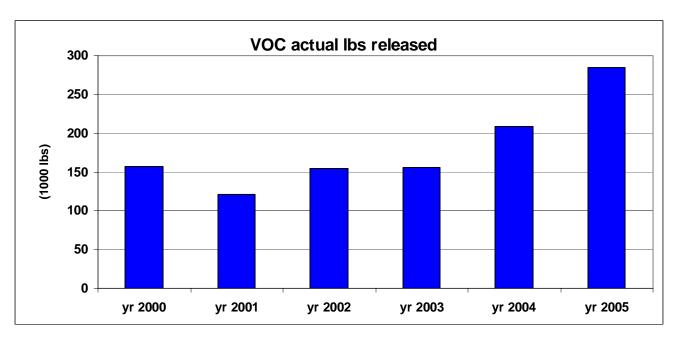
Results:

VOC emissions increased in 2005 over 2004 by 27%. There was also a 20 % increase in production output during the same period. A new CF6 ceramic fibers oven was brought on line during 2nd quarter and a new coater and drying oven was installed to make coated membrane for fuel cell manufacturing late in the year. This explains why there was an increase in the actual VOC emissions for the year. A new thermal oxidizer was also added to CF5 and CF6 ceramic ovens. Destruction efficiency based on the certified stack test is over 99% for VOCs and formaldehyde. No credit was taken for VOC control from these lines until the 4th quarter, 2005. The thermal oxidizer was on line the entire year of 2005. The C5 coating line that produces a variety of adhesive tapes had an increase of 11% VOC emissions. There has been some progress in converting solvent –based tape products to water-based products on this line.

Figure 1

VOC Goal	baseline yr 2000	year 1 yr 2001	year 2 yr 2002	year 3 yr 2003	year 4 yr 2004	Target yr 2005
Total good output (1000 lbs)	20,692	20,849	23,510	29,334	42,262	50,587
Total good output change (%)		1%	14%	42%	104%	144%
VOC (1000 lbs)	157	122	155	156	208	284
VOC lbs change to date		(23%)	(2%)	(0%)	33%	81%
VOC ratio, actual (lbs/1000 lbs)	7.59	5.83	6.57	5.33	4.93	5.61
VOC ratio, target (lbs/1000 lbs)	7.59	7.21	6.83	6.45	6.07	5.69
VOC ratio actual change to date (%)	baseline	(23%)	(13%)	(30%)	(35%)	(26%)
VOC ratio change needed (%)		(5%)	(10%)	(15%)	(20%)	(25%)





Objective #3:

Reduce by 10% the reportable releases of 2004 TRI (Toxic Release Inventory) chemicals/ pound of good output as compared to RY 2003.

Target #3:

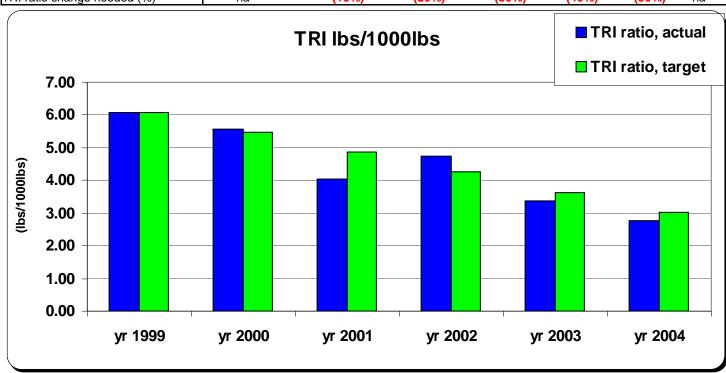
Reduce 2004 reportable TRI releases/# good output by 10% compared to year 2003 to achieve an overall 50% reduction in the TRI release ratio compared to 1999.

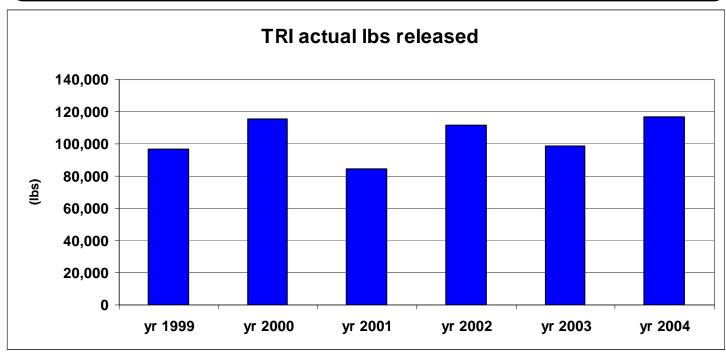
Results:

Reportable TRI releases in 2004 were mainly from the C5 tape coating operation (toluene). Although actual reported releases were more than 2003, production output also increased more than 28% from the previous year.

Figure 2

TRI Goal	baseline yr 1999	year 1 yr 2000	year 2 yr 2001	year 3 yr 2002	year 4 yr 2003	year 5 yr 2004	yr 2005
Total good output (1000 lbs)	15,928	20,692	20,849	23,510	29,334	42,255	na
Total good output change (%)		30%	31%	48%	84%	165%	
TRI (lbs)	96,674	115,356	84,526	111,500	98,500	116,700	na
TRI lbs change to date		19%	(13%)	15%	2%	21%	na
TRI ratio, actual (lbs/1000 lbs)	6.07	5.57	4.05	4.74	3.36	2.76	na
TRI ratio, target (lbs/1000 lbs)	6.07	5.46	4.86	4.25	3.64	3.03	na
TRI ratio actual change to date (%)	baseline	(8%)	(33%)	(22%)	(45%)	(54%)	na
TRI ratio change needed (%)	na	(10%)	(20%)	(30%)	(40%)	(50%)	na





Objective # 4:

Reduce solid & chemical waste produced/pound of good output at least another 5% in 2005 to achieve an overall reduction of 25% by the end of 2005.

Target # 4:

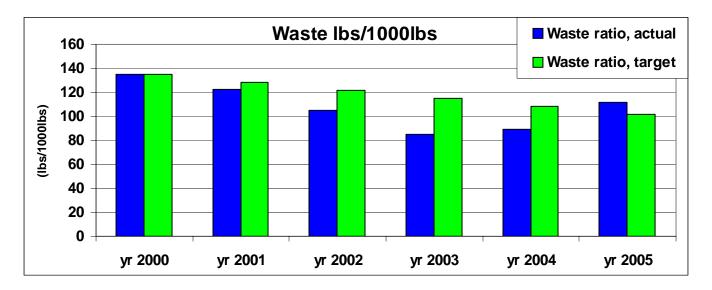
Reduce solid and chemical waste/# good output by at least 5% in 2005 based on levels reported in 2004.

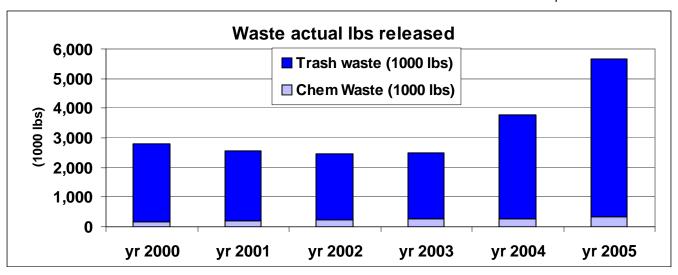
Results:

Solid waste sent to a waste to energy facility increased by 66% from 2004. The startup of a new film line and modifications to existing lines created this additional waste that could not be offset by gains in production output. Therefore this goal attained only an 18% reduction vs. an overall goal of 25% in five years (2000 baseline). The startup of CF6 ceramic fibers line also created additional solid waste to the landfill.

Figure 3

metric	baseline yr 2000	year 1 yr 2001	year 2 yr 2002	year 3 yr 2003	year 4 yr 2004	Target yr 2005
Total good output (1000 lbs)	20,692	20,849	23,510	29,334	42,262	50,587
Total good output change (%)		1%	14%	42%	104%	144%
Chem Waste (1000 lbs)	153	205	223	253	282	341
Chem ratio, actual (lbs/1000 lbs)	7.39	9.81	9.50	8.63	6.67	6.74
Chem ratio, target (lbs/1000 lbs)	7.39	7.02	6.65	6.28	5.92	5.55
Trash waste (1000 lbs)	2,646	2,353	2,238	2,246	3,488	5,310
Trash ratio, actual (lbs/1000 lbs)	127.9	112.8	95.2	76.6	82.5	105.0
Trash ratio, target (lbs/1000 lbs)	127.9	121.5	115.1	108.7	102.3	95.9
Total Waste (1000 lbs)	2,799	2,557	2,462	2,499	3,770	5,645
Waste lbs change to date		(9%)	(12%)	(11%)	35%	102%
Waste ratio, actual (lbs/1000 lbs)	135.3	122.7	104.7	85.2	89.2	111.6
Waste ratio, target (lbs/1000 lbs)	135.3	128.5	121.7	115.0	108.2	101.5
Waste ratio actual change to date (%)	baseline	(9%)	(23%)	(37%)	(34%)	(18%)
Waste ratio change needed (%)		(5%)	(10%)	(15%)	(20%)	(25%)





The following table indicates the amount, type, and recovered value of recycled by-product from the facility in 2005:

Table 2: 2005 Recycled Materials

Recycled Waste	<u>Pounds</u>	\$ Recovered
Plastics Metals Aluminum cans Silicone Liner Cardboard	6,145,191 245,325 2,314 264,182 338,969	\$385,306 \$277,723 \$775 \$14,560 \$723
Office paper Security waste paper Recyclable pallets Recycled Drums	22,539 pounds 5,650 pounds 2,296,400 pounds 2,816 drums	

Objective # 5:

Meet the requirements of the Wisconsin DNR Cooperative Environmental Agreement and the EPA National Environmental Performance Track (NEPT) for 2005

Target # 5:

Meet 2005 WDNR CEA and EPA NEPT requirements.

Details:

WDNR Cooperative Agreement:

- annual report due by 1/30/2004 to WDNR
- manage the flexible permitting in the Agreement
- meet with interested person's group as required

EPA NEPT Agreement

- annual report due 4/1/2004
- meet 2004 normalized performance commitments
- public outreach
- renew the program application for 2005-2007

Results:

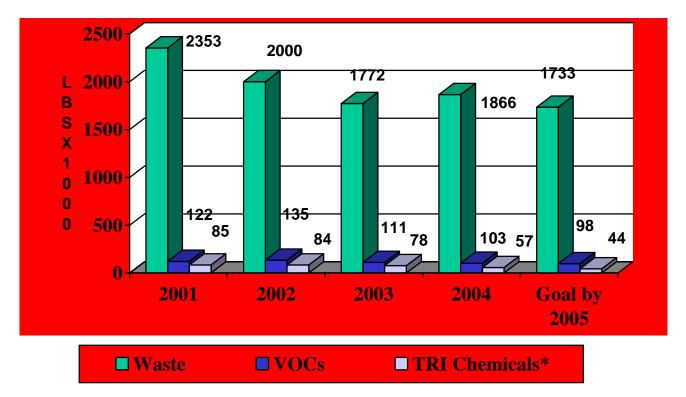
WDNR Cooperative Agreement:

- **Baseline report due by 1/30/2005 to WDNR -** baseline report was submitted to the WDNR on 1/26/2005.
- **Title V Part III pre-approved projects** six projects were initiated under this feature in 2005. See Appendix B for details of these pre-approved projects
- **Interested Persons Group** the interested person group met twice in 2005. Refer to the Interested Persons Group section in this report.

EPA NEPT Agreement

- **2004 annual report due 4/1/2005** the annual report was submitted prior to the deadline and accepted by the USEPA Region V in November 2005. Refer to this link for the report and find the report for 3M-Menomonie: https://yosemite.epa.gov/opei/ptrack.nsf/faMembers?readform
- **Meet 2004 normalized performance commitments** although the energy commitment was met in 2004, commitments for VOC, TRI releases, and solid waste were not met. Refer to the following graph. Reasons for not meeting the commitments are found in the annual report.





- Renew the NEPT membership for 2005-2007 Refer to this link for the renewal application for 3M-Menomonie: https://yosemite.epa.gov/opei/ptrack.nsf/faMembers?readform. Three new performance commitments were made for reductions in non-hazardous waste film sent to energy recovery, energy use, and VOC emissions. A fourth commitment for wild life habitat and land conservation was also added.

Objective # 6:

Develop and implement a system for meeting the reporting and recordkeeping requirements of the Title V facility air permit

Target # 6:

Develop and implement a system for meeting the reporting and recordkeeping requirements of the Title V facility air permit by 3/31/2005

Results:

A comprehensive reporting spreadsheet was created for the plant departments to report VOC emissions and coatings applied to meet the Title V permit reporting requirements. Refer to Appendix D.

Objective # 7:

Reduce waste treatment costs by 20% for regulated and non-regulated waste in 2005.

Target #7:

Reduce waste treatment costs by 20% for regulated and non-regulated waste in 2005 by compacting non-pumpable waste < 200 # / drum

Results:

A Green Belt Six Sigma project was chartered and completed for this project. Information to compile exact cost savings for 2005 was not available at the time of this report. However non-pumpable waste drums shipped that weighed less than 200 pounds decreased 11% in 2005 compared to 2004.

Regarding the status of implementation of an Integrated Contingency Plan (ICP)

The ICP placed into one single plan the following legally required plans that call for emergency response planning: OSHA HAZWOPER plan, RCRA contingency plan, LEPC plan, OSHA Emergency Action Plan, OSHA & 3M PSM standard/guidelines, EPA SPCC spill plan, and the EPA RMP "general duty" clause. The basic outline for the plan was developed using the USEPA template document. Although the ICP has been developed and implemented, yearly updates of the plan will be submitted to local government agencies (police, hospital, fire, and LEPC).

Regarding Changes to the 2006 EMS Targets & Objectives:

Listed below are the 2006 EMS Objectives and Targets. A new corporate environmental initiative called Environmental Targets 2010 (ET10) will be the program that will guide the EMS targets and objectives for the next five years. In addition, other opportunities to promote continuous improvement in environmental performance have been identified.

2006 EMS Objectives & Targets

- Sustain or reduce the ratio of solid and chemical waste per pound of good output (good output is now defined as finished and semifinished goods) produced in 2006 to meet the target of reducing the overall waste ratio 20% per pound of good output by the end of 2010 (2005 as the base year).
- □ Sustain or reduce the ratio of VOC emissions per pound of good output (finished and semifinished goods) in 2006 to 6.9 # VOC/1000# of good output
- □ Submit at least two 3P (Pollution Prevention Pays) projects for the site by the end of 2006.
- □ Improve the self-assessment score for GEMSA in 2006 from 97% to 100%
- □ Meet the requirements of the Wisconsin DNR Cooperative Environmental Agreement and the USEPA National Environmental Performance Track for 2006
- □ Achieve certification as a WHC (Wildlife Habitat Council) site by 12/31/2007

- □ Develop and implement a system to monitor wastewater discharges to insure compliance with local regulations by 12/31/06
- □ Working with the Environmental Operations contact, modify the emission factors used for OSD coater emissions testing by 12/31/2006

Regarding Actual Waste Reductions:

A summary of 2004/2005 3M-Menomonie wastes and air emissions is shown in Table 3:

Table 3: 2004/2005 Waste & Air Emissions

(Lb.)

Type of	2004	2005	%	Comment
Waste			Change	
Regulated Hazardous Waste:	198,052	187,776	- 5 %	All hazardous waste sent to corporate waste incinerator, Cottage Grove, MN.
Parts washer solvents	808	1035	+ 28 %	Sent to Safety-Kleen, Lacrosse, WI. This material is recycled
Non- regulated chemical waste	112,981	158,491	+ 29 %	Sent to corporate incinerator.
Landfill waste	514,894	1,067,736	+ 107 %	Sent to Dunn County Waste Management. This increased due to not using a WTE facility like part of 2004
3M proprietary solid Waste	2,584,298	4,293,278	+ 66 %	Proprietary product scrap sent to secured waste facility for energy burn. Startup of new optical film line and modifications to existing lines caused the additional waste being generated
VOC emissions	208,252	284,443	+ 37 %	Startup of new CF6 ceramic fibers line and increases in tape production account for the increase in 2005
Reportable TRI chemicals releases	98,500 (RY 2003)	118,000 (RY 2004)	+ 32 %	Toluene from C5 process accounts for most of the reported releases

Waste and emissions "normalized" or adjusted for changes in production activity during these same periods are shown in Appendix A at the end of this report.

Regarding Operational Flexibility:

Requests for operating flexibility are summarized in Appendix B at the end of this report. Savings in both administrative and start-up times are estimated in the table in the Appendix.

Regarding additional time requirements for fulfilling this Agreement include:

Requirements Added: Additional Time

Compiling this Baseline Report 25 hours/year Managing the Interested Persons Group 18 hours/year

Regarding Overall Assessment of the Success of the Agreement:

3M Menomonie has substantially reduced the administrative time and startup time on the preapproved projects completed or started in 2005. 3M Menomonie has an effective EMS and has met most of the performance commitments as outlined in the agreement.

Questions and requests for additional information should be directed to Michael Wendt, EHS Department, at the address below:

3M Company – Menomonie Plant 1425 Stokke Parkway Menomonie, WI 54751 Phone: 715/235-5541

E-mail: mrwendt@mmm.com

Appendix A: 2005 Wastes Normalized for Production Activity

(All waste in pounds)

2005 Normalizing Factor

<u>Lb. of good output produced in 2005</u> = $50,587 \times 10^3$ = 1.20 Lb. of good output produced in 2004 $42,255 \times 10^3$

2005 Normalized Waste Quantity

<u>Lb. of waste produced in 2005</u> 2005 Normalizing Factor

Example: Lb. 2005 Regulated Hazardous Waste = 187,776 = 137,536

2005 Normalizing Factor 1.20

Type of	2004	2005	2005	% Change
Waste	(Actual)	(Actual)	(Normalized)	
Regulated				
Hazardous	198,052	187,776	156,480	- 21 %
Waste:				
Parts washer	808	1035	863	+ 7 %
solvents				
Non-	112,981	158,491	132,075	+ 17 %
regulated				
chemical				
waste				
Landfill	514,894	1,067,736	889,780	+ 73 %
waste				
Proprietary	2,584,298	4,293,278	3,577,732	+ 38 %
solid Waste				
VOC	208,252	284,443	237,036	+ 14 %
emissions				
Reportable	98,500	118,000	98,333	- 0.1 %
TRI chemical	(RY 2003)	(RY 2004)		
releases	·			

Appendix B

Title V Part III Pre-approved Projects - 2005

Project	roject			Startup				
Name	Description	Date notified	Startup [Date]	Notification	Est. admin time saved	Estimated startup time saved		
CF4 Fiber Line tube furnace	Addition of a tube furnace to CF4, and change from use of "typical" to "worst-case" RM	12/23/2004	2/22/2005	4/21/2005	16 hours	1 month		
CF5 Fiber Line RM Throughput	Increase allowable RM throughput above 48 lb/hr	1/4/2005	1/11/2005	2/10/2005	16 hours	1 month		
MRC 6 - Annealing Oven	Addition of a 1.6 MMBTU/hr annealing oven to MRC 6	02/25/2005	7/20/2005	8/19/2005	16 hours	1 month		
GDL Line	Installation of new web coating line. Transfer of Dryer #5 and #6 from Stillwater for production of fuel cell membranes.	7/13/2005	12/12/2005	1/11/2006	40 hours	3 months		
Ethanol Clean-up in Cr Plating	Switch from IPA to Ethanol for all cleaning in existing Chromium Electroplating Operations.	9/2/2005	1/3/2006		16 hours	minimal		
MRC7 Line	Installation of new web coating line and 2 natural gas fired ovens.	12/06/2005			40 hours (est.)	3 months		
					Total hours saved: 144			

Appendix C: Earth Day 2005



Trout Stream Restoration on Gilbert Creek



MHS High School Students & 3M Volunteers

Appendix D: Title V Monthly Reporting

All values in pounds	Permit		Quarter 1 200	5		Quarter 2 2005	5
unless otherwise noted	Limits	Jan '05	Feb '05	Mar '05	Apr '05	May '05	Jun '05
Summary Web Coatings							
Department							
E-Beam	N/A	465.15	356.00	549.00	454.50	367.00	581.00
C5 Tape	N/A	56,906.43	71,225.97	94,260.23	74,228.77	79,131.37	106,741.43
OSD	N/A	152,441.56	142,025.97	122,226.93	116,604.59	111,881.86	135,812.83
PC&RP	N/A	91,303.50	47,547.00	92,074.50	89,447.00	63,641.00	102,655.00
Total Web Coatings	N/A	301,116.64	261,154.94	309,110.66	280,734.86	255,021.23	345,790.26
Total Web Coatings (tons)	N/A	150.56	130.58	154.56	140.37	127.51	172.90
Running Average	N/A	301,116.64	281,135.79	290,460.75	288,029.27	281,427.67	292,154.77
Running Average (tons)	N/A	150.56	140.57	145.23	144.01	140.71	146.08
Summary VOCs							
Department							
C5 Tape	N/A	9,845.52	10,940.95	12,228.08	9,207.39	7,453.39	22,872.02
OSD	6,650	2,698.43	2,468.29	2,327.75	2,140.59	2,097.66	2,460.55
SF&C	13,500	5,614.55	5,300.27	6,351.25	6,181.66	7,054.20	9,316.29
OSD Chrome Plating	833	257.40	303.60	437.36	341.88	602.36	613.36
OSD Cladding Booth	N/A						
TSS Spray Booth	2,337	400.20	533.60	613.64	400.20	266.80	480.24
Total VOCs	41,500	18,816.10	19,546.71	21,958.08	18,271.71	17,474.41	35,742.46
Total VOCs (tons)	20.75	9.41	9.77	10.98	9.14	8.74	17.87
Running Average	41,500	18,816.10	19,181.40	20,106.96	19,648.15	19,213.40	21,968.24
Running Average (tons)	20.75	9.41	9.59	10.05	9.82	9.61	10.98
VOC's / Costings							
VOC's / Coatings	0.00	0.000	0.075	0.074	0.005	0.000	0.400
Total	0.20 0.20	0.062 0.062	0.075 0.069	0.071 0.069	0.065 0.068	0.069 0.068	0.103 0.074
Running Average	0.20	0.002	0.009	0.009	0.000	0.000	0.074
Summary Formaldehyde							
Department							
SF&C	166	54.75	50.80	59.17	54.79	66.51	96.81
Total Formaldehyde	166	54.75	50.80	59.17	54.79	66.51	96.81
Running Average	166	54.75	52.78	54.91	54.88	57.20	63.81